

# AN IMPROVEMENT ON A STRAP SUPPORTING POST CAPABLE OF AUTOMATICALLY WINDING A STRAP AROUND IT

## BACKGROUND OF THE INVENTION

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### 1. Field of the invention

The present invention relates to a strap supporting post capable of automatically making a strap wound therearound, more particularly one, which is equipped with a reduction mechanism so that the strap won't be 10 wound back around the post too rapidly by the winding mechanism after it has been stretched for use.

### 2. Brief Description of the Prior Art

Referring to Figs. 5, and 6, a conventional strap supporting post 4 is comprised of a post part 41, and a winding member, and has a strap 42 connected thereto. The post part 41 can stand on the ground, and has 15 several securing bars 48 equidistantly spaced on an outer side of an upper end thereof. The winding member is arranged on top of the post part 41, and includes a tube-shaped part 44, a shaft 46, and a return spring 45. The strap 42 is secured to an outer side of the tube-shaped part 20 44 at a first end, and has a connecting element 43 connected to a second end thereof; the connecting element 43 is usually made of plastics, and is formed with an engaging gap 47. The shaft 46 is connected to the return spring 45, and is rotary together with the housing part 44 on the post part

41 so that the strap 42 is usually wound around the tube-shaped part 44 at a not-in-use position, and the return spring 45 will store up a return force thereon when the strap 42 is pulled away from the tube-shaped part 44 to a stretched position by the second end connecting element 43 5 thereof, which return force will make the tube-shaped part 44 rotate in reverse direction to wind the strap 42 back around the tube-shaped part 44 in case the strap 42 is released.

The strap supporting post 4 with the strap 42 is usually used in public events to define areas for ordinary people such as the audience 10 and areas for special guests so that the audience and the special guests can be appropriately separated; connecting element 43 of one strap 42 of the kind can be engaged with securing bar 48 of another post 4 after the strap 42 is stretched to form a long line therefore several posts with straps of the same kind can be used to separate a place into several 15 sections according to the user's needs.

However, the above strap supporting post 4 is found to have disadvantages as followings:

1. The connecting element 43 joined to the free end of the strap 42 will be made to move towards the post 4 very fast by the winding member 20 in case the strap 42 is released from a long stretched in-use position to be wound back around the tube-shaped part 44. Consequently, the connecting element 43 will hit the tube-shaped part 44 very hard, and causes loud noise.

2. For the same reason, the connecting element 43 is prone to get damaged if the strap 42 is directly released from a long stretched in-use position, and no effort is made to counteract the return spring 45. And, the connecting element 43 is likely to swing fast, and hits 5 and hurts people near to the post.

3. For the same reason, service life of the whole strap supporting post will be shortened.

## SUMMARY OF THE INVENTION

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It is a main object of the present invention to provide a speed reduction mechanism to a strap supporting post having a winding mechanism for automatically winding a strap to overcome the above disadvantages.

15 The speed reduction mechanism includes a rotary member turnable together with the winding mechanism, and a stationary member secured to on top of the post; the rotary member has rubbing bars pivoted to a middle part thereof; the rubbing bars are biased towards the middle part by tension springs; centrifugal force will act on the rubbing bars when 20 the winding mechanism functions after the strap has been released from stretched position; the rubbing bars are pivoted towards the stationary member when speed of rotation of the winding mechanism is so high that the centrifugal force is greater than force of the tension springs, thus

slowing down rotation of the winding mechanism, and preventing a connecting element from swing too fast too hurt people, which is joined to the free end of the strap.

## 5 BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be better understood by referring to the accompanying drawings, wherein:

10 Fig. 1 is an exploded perspective view of the strap supporting post according to the present invention,

Fig. 2 is a cross-sectional view of the strap supporting post according to the present invention,

15 Fig. 3 is another cross-sectional view of the strap supporting post according to the present invention,

Fig. 4 is a view showing the function of the speed reduction mechanism of the strap supporting post of the present invention,

Fig. 5 is a perspective view of the conventional strap supporting post as described in the Background,

20 Fig. 6 is a top view of the conventional strap supporting post, and

Fig. 7 is a partial cross-sectional view of the conventional strap supporting post.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figs. 1 to 3, a preferred embodiment of a strap supporting post in the present invention includes:

- a post part 1 capable of standing on the ground;
- 5 a winding mechanism, which is arranged on top of the post part 1, and is comprised of a housing part 11, a shaft 15, a return spring 14, an a base formed with screw holes 18 on an annular portion thereof; the base is fixedly connected to top of the post part 1; a strap 12 is securely connected to an outer side of the housing part 11 at a first end, and has a
- 10 connecting element 13 connected to a second end thereof; the connecting element 13 is usually made of plastics, and is formed with an engaging gap (not numbered); the shaft 15 is connected to the return spring 14 such that it is rotary together with the housing part 11 on the post part 1, and that the strap 13 is usually wound around the housing part 11 at a
- 15 not-in-use position, and the return spring 14 will store up a return force thereon when the strap 12 is pulled away from the housing part 11 to a stretched position by the second end connecting element 13 thereof, which return force will make the housing part 11 rotate to wind the strap 12 back around the housing part 11 when the strap 12 is released; the
- 20 shaft 15 has an upper end projecting from top of the housing part 11, which upper end has two flat sides 16 facing opposite directions, and two threaded arc-shaped sides 17 facing opposite directions; and

a speed reduction mechanism, which includes a rotary member 2,

and a stationary member 3; the rotary member 2 is comprised of a middle part 21, three rubbing bars 23, and three tension springs 25; the middle part 21 has a middle cavity 211, a connecting hole 213 extending through the middle of the middle cavity 211, three equidistantly spaced holding rooms 214, three equidistantly spaced connecting projections 215 each formed with a vertically extending pivotal hole 218, three spaced apart trenches 216 each having a connecting pole 217 sticking up from it; the connecting hole 213 has two opposing flat sides 212, and two opposing threaded arc-shaped sides (not numbered); each rubbing bar 23 has a working end 235 at a first end, a gap 231 at a second end, a vertically extending through hole 232 communicating with the gap 231, a trench 234 on an inward side, and a connecting pole 233 sticking up from the trench 234; each first working end 235 of the rubbing bars 23 is formed with a convexly curved outward side; the stationary member 3 has a cap portion on the top, several elongated connecting portions 31 projecting down from an annular portion of the cap portion; each of the elongated connecting portions 31 has a securing bar 33 on an outward side thereof, and has a through hole 34; the cap portion has a rubbing surface 32 on an inner side of the annular portion; the connecting element 13 is provided for engagement with securing bar 33 of another strap supporting post after the strap 12 is long stretched to separate an area.

In combination, the upper end of the shaft 15 is closely passed

through the connecting hole 213 of the middle part 21 of the rotary member 2 of the speed reduction mechanism, and a nut 22 is screwed onto the upper end of the shaft 15 so that the middle part 21 can turn together with the winding mechanism. The rubbing bars 23 are pivoted 5 to respective ones of the connecting projections 215 of the middle part 21 at the second ends thereof with pivotal pins 24 being passed through the holes 232 thereof and the pivotal holes 218 of the connecting projections 215, and with the first working ends 235 thereof being received in respective holding rooms 214 of the middle part 21. Each 10 rubbing bar 23 is biased close to a corresponding one of three sides of the middle part 21 by means of one tension spring 25, which is passed around the connecting poles 233, and 217 at two ring-shaped ends 251, and 252 thereof. The stationary member 3 is fixedly connected to the base of the winding mechanism with screws 35 being passed through the 15 through holes 34 thereof, and screwed into the screw holes 18 of the base of the winding mechanism, and with the rubbing surface 32 of the cap portion opposing the outward sides of the rubbing bars 23.

Referring to Fig. 4, the return spring 14 will make the winding mechanism and the speed reduction mechanism turn for the strap 12 to 20 be wound back around the housing part 11 after the strap 12 is released from a long stretched in-use position while centrifugal force will make the rubbing bars 23 pivot outwards of the respective holding rooms 214 when the speed reduction mechanism is forced to turn at such a speed

that the centrifugal force is greater than the force of the tension springs 25 on the rubbing bars 23. Consequently, the first convexly curved working ends 235 of the rubbing bars 23 are rubbed against the rubbing surface 32 of the cap portion of the stationary member 3, and in turns, 5 friction of the rubbing surface 32 against the rubbing bars 223 reduce the speed of rotation of the rotary member 2 and the winding mechanism, making the strap 12 wound back around the housing part 11 at a low speed. After the strap 12 is completely wound around the housing part 11, the rubbing bars 23 will be made to pivot away from the rubbing surface 10 32 of the stationary member 3 by the tension springs 25, and the strap 12 is again allowed to be pulled to long stretched position. Furthermore, because the strap 12 is to be stretched for use by a user's hand, rotation of the rotary member 2 won't be fast enough for the rubbing bars 23 to come into contact with the rubbing surface 32 when the strap 12 is being 15 stretched, and in turns, the strap 12 can be smoothly pulled to the long stretched position.

From the above description, it can be easily understood that the strap supporting post in the present invention has advantages as followings:

20 1. When the strap 12 is released from a long stretched in-use position, centrifugal force will act on the rubbing bars 23, and the convexly curved working ends 235 of the rubbing bars 23 will be rubbed against the rubbing surface 32 of the stationary member 3 in case the

rotary member 2 is forced to turn at such a speed that the centrifugal force is greater than the force of the tension springs 25 on the rubbing bars 23. And, friction of the rubbing surface 32 against the rubbing bars 23 will make the strap 12 to be wound back around the housing 5 part 11 slowly.

2. For the same reason, the connecting element 13 is prevented from swinging fast, hitting the post part very hard or hitting and hurting people near to the post after the strap 12 is released from a long stretched in-use position. Consequently, service life of the present 10 post will not be undesirably reduced.
3. When the strap 12 is completely wound around the housing part 11, the rubbing bars 23 will be made to pivot away from the rubbing surface 32 by the tension springs 25. And, when the strap 12 is pulled away from the housing part 11 by a user's hand, rotation of the rotary 15 member 2 won't be fast enough for the rubbing bars 23 to come into contact with the rubbing surface 32, and in turns, the strap 12 can be smoothly pulled to the long stretched position.